cludes modifications the result of disuse and alterations which bear a prospective relation to the future wants of the altered insect form.

It appears at first sight that this separation into different stages of life is necessary for the insect, and that it must have a time devoted to eating, digesting, and assimilating, a quiet condition devoted to internal changes, and a stage where reproduction can be carried on. But this generalisation fails when it is remembered that some larvæ eat and reproduce, and some imagos reproduce and lead bloodthirsty lives also. It is important to recognise the distinction already hinted at. The growth of the young embryo larva within the egg, and that of the escaped and skin-shedding larva, is progressive, but the descriptions given of the changes in the shape and in the anatomy of the digestive organs of the pupa and imago, prove that they do not depend upon simple progression from elementary condition to complexity. The changes of structure belong to a different order of things to the simple growth of the larva's tissues; they appear to be superadded.

(*To be continued.*)

NOTES

THE Medals in the gift of the Royal Society have this year been awarded as follows:—The Copley Medal has been awarded to Professor Friedrich Wöhler, of Göttingen, For. Memb. R.S., for his numerous contributions to the Science of Chemistry, and more especially for his researches on the products of the decomposition of Cyanogen by Ammonia; on the Derivatives of Uric Acid; on the Benzoyl Series; on Boron, Silicon, and their compounds; on Titanium, and on Meteoric Stones. A Royal Medal has been awarded to Professor Thomas Anderson, M.D., for his investigations on the Organic Bases of Dippell's Animal Oil; on Codeine; on the Crystallised Constituents of Opium; on Piperin and on Papaverin; and for his researches in Physiological and Agricultural Chemistry. A Royal Medal has been awarded to Mr. Henry John Carter, F.R.S., for his long-continued and valuable researches in Zoology, and more especially for his inquiries into the Natural History of the Spongiadæ. The Rumford Medal, awarded every two years, has been awarded to Anders Jonas Angström, For. Memb. R.S., for his Researches on Spectral Analysis.

THE annual meeting of the Fellows of the Royal Society, for the election of officers and Council for the ensuing year, will be held, as usual, on the 30th inst. As we have before announced, Dr. Sharpey, after a long period of service as secretary, resigns his functions, which have been of such great advantage to the Society, and by the performance of which he has earned the thanks and respect of all men of science, Prof. Huxley being nominated by the council as his successor.

IN the *Boston Daily Advertiser* for Saturday, Oct. 26, 1872, the conclusion of Prof. Tyndall's last lecture is thus reported:—"There are three great theories which enable the human mind to open the secrets of nature—the theory of gravitation, the mechanical theory of heat, and the undulatory theory of light. These three pillars, as far as the human intellect is concerned, support the universe. To whom are we indebted for these discoveries? To men who had no practical ends in view, and who cared only for the truth. To-day, when there are so many temptations to young men to leave pure science for practical aims, it behoves us to look with sympathetic eyes upon the investigator who makes all this knowledge possible. I met on the steamship *Russia* a respected friend who ascribed the electric telegraph to a source to which I certainly should not have thought of referring it. It is the direct outcome of men who never made a shilling by it. Volta, Faraday, never made a shilling by it. All honour to the men who make these discoveries. Gauss and Weber, at the University of Göttingen, actually constructed a telegraph line from the physical cabinet to the observatory. Give all honour to the men who apply discoveries, but do not forget the men who make them. Many of you in this country have made fortunes, and have shown that you know how to apply them. Look with sympathetic eye upon the investigators. Give them opportunities. Do not overload them with other work. 'Cast your bread upon the waters,' and believe me 'it will return to you after many days.' My course among you is nearly over. I began it with some anxiety and end it with regret. It has been harder for me at times than I had expected, and I owe much to my assistants. I shall long and gratefully remember my reception on the occasion of my first lecture here. If I am treated in the same manner elsewhere, I shall return to the old country full of content. During my stay here I have heard 'the old country' mentioned again and again. You cannot abolish your antecedents. Out of England's loins you have come. Your ancestry is stamped upon your faces, your laws, your politics, and your characters. De Tocqueville, sympathising with democratic institutions, says, regarding England and America: "I refuse to regard these people as two; one is the outgrowth of the other." Atrocious ignorance of each other is at the bottom of all our differences. I trust that hereafter each nation will respect the individuality of the other; while thoroughly maintaining its own.' The lecture was listened to with great attention, and loudly applauded at the close. Every point made in behalf of the investigators, and upon our relations to the mother country, received loud approbation. Our report cannot do justice to Dr. Tyndall's earnestness in the latter portions of his lecture. It is to be hoped that some of our so-called 'practical men' may take to heart the lessons he has tried to teach them."

THE late Prof. De Morgan, in a note to his article on Tables in the "English Cyclopædia," strongly expresses his regret that the British Museum did not purchase Dr. Hutton's valuable mathematical library, and, consequently, the first set of mathematical tables ever collected in England was dispersed. With a view to avert a similar break-up, we may inform our readers that at a very early date the mathematical collections of the late Mr. Babbage must be disposed of. It is with reference to these that De Morgan, in the above-cited article, acknowledges his indebtedness ("large and rare collection of Tables"). Its excellence, however, is not confined to this special department only. We learn that catalogues will be issued in the course of a few days.

IN reference to the Swiney Lectureship, which we announced recently as having become vacant, we venture to hope the post will not be thrown away on some one who is already well off, and has taken his place in life, but that it will be given to some young man who has shown himself well qualified for scientific research, and who may thus be enabled to devote his time to investigations which may lead to results of enduring value. Several eminent men have already held this lectureship, including, we believe, Dr. Carpenter.

PROF. WEISS, of the Vienna Observatory, has recently passed through London, on his return from a tour of inspection through the United States, where he has visited all the principal observatories, in order to collect materials for a report on the instruments demanded by modern science in a first-class observatory like that of Vienna, which is about to be removed and extended. It appears that the 26-inch object-glass ordered by the American Government, as soon as the completion of Mr. Newall's magnificent instrument has established the feasibility of such an enormous aperture, is already finished, and the mounting is in a forward state.

Silliman's Journal for November mentions the death of the Rev. John B. Perry, Professor of Primordial Geology in Harvard College, and of Dr. John F. Frazer, Professor of Natural Philosophy and Chemistry in the University of Pennsylvania.

THE death is announced, in the Isle of Wight, on Friday last, of Dr. H. B. Leeson, F.R.S., for many years lecturer on chemistry at St. Thomas's Hospital.

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The University of Aberdeen certainly is not disposed to neglect science in looking out for a Lord Rector; among those spoken of to be put up for the next election, are Mr. Darwin, Prof. Huxley, and Dr. Lyon Playfair.

We are glad to call attention to the fund now being raised for the education and maintenance of the family of Mr. John Cargill Brough, subscriptions to which may be paid at Messrs. Robarts and Lubbock's bank. We understand that a considerable amount has already been received.

The winter course of lectures at South Kensington Museum for the instruction of women in science and art was opened on Monday by Prof. Duncan. The course is to consist of three series—the first by Prof. Duncan, on "Cosmogony and the World as a Planet;" the second by Prof. Carey Foster, on "Physics;" and the third by Prof. Rutherford, on "Physiology." There was a large attendance of ladies.

The Committee of Directors of the Crystal Palace have resolved to extend the uses of that Institution by establishing practical engineering classes, in connection with their School of Art, Science, and Literature, under the Principalship of Mr. J. M. Wilson, Assoc. Inst. C.E. Such a preparatory course will render pupils on entering an engineer's office at once useful to their employers, and will enable them to take advantage of the opportunities offered to them during the time they are articled. These classes have been established for the purpose of affording to students of civil and mechanical engineering the advantage of thorough practical instruction in the rudiments of either profession, and in the manipulation of materials. The classes are also available for gentlemen anxious to become engineering draughtsmen, or to compete for the Whitworth Scholarships, or to enter the Steam Mercantile Marine. The course of instruction will consist of three terms extending over twelve months. One term will be spent in the drawing office, one in the pattern shop and foundry, and one in the smith's fitting and erecting shops. The students will be engaged in mechanical drawing, estimating and calculating, pattern-making, and constructing machinery for the market. Lectures will be delivered from time to time by the Principal, or by some eminent professor, on subjects connected with theoretical and practical engineering, and the students will be required to pass an examination upon such lectures at the expiration of each term. Convenient and extensive shops and offices, supplied with the best engineering machinery, have been fitted up for the purposes of the institution. The shops will be finished and the teaching commenced on January 1, or within a few days of that date. The premium for the year's instruction will be fifty guineas. The Crystal Palace is in many respects most suitable for such a purpose; for, irrespective of its being central and easy of access, it contains so many engineering models, works of science and art, hydraulic, pumping, and other machinery, that illustrations of important works in great variety are always accessible.

Lord F. Cavendish, M.P., presided on Monday at a meeting of the committee appointed to consider the proposed plans for establishing a College of Science at Leeds. The cost originally estimated was 61,000*l.*; but the funds are not forthcoming, and a committee was appointed to reconsider the subject.

Sir H. C. Rawlinson, in his inaugural address on Monday night to the Geographical Society, referred to two contemplated African expeditions—one, got up by Livingstone's friends, and called the "Livingstone Congo Expedition," is to ascend the Congo from above the rapids, and endeavour to penetrate to the equatorial lake where Livingstone's rivers are lost, and in the vicinity of which it is expected the great traveller will be found at the close of next year. Livingstone's close friend, Mr. J. Young, of Kelly, has taken upon himself the expenses of the expedition to the amount of 1,500*l.* or 2,000*l.* A rival German expedition has been officially announced as in preparation for the same reason.

The following numbers are stated to have been sold of Mr. Murray's scientific books at his annual "sale" last week:—6,200 of Mr. Darwin's new work on the "Expression of the Emotions in Man and Animals;" 1,100 of Darwin's "Origin of Species" and other works; 350 of Lyell's "Principles of Geology," 2 vols.; 900 of Lyell's "Students' Elements of Geology;" 1,500 of Kirk's "Handbook of Physiology;" 300 of Sir Roderick Murchison's "Siluria;" 1,200 of Prof. Newth's "Natural Philosophy;" 380 of Whymper's "Scrambles on the Alps."

A telegram from Copenhagen states that Mr. Edward Whymper has arrived there from his second journey of exploration in North Greenland. He brings with him rich collections of curiosities, among which are some very singular specimens of fossil wood.

The Conversazione of the Photographic Society was held on Tuesday evening last, and the Annual Exhibition of Photographs will be open at the rooms of the Society, No. 9, Conduit Street, till the 30th inst., from nine till dusk, and on Monday and Saturday evenings.

The members of the Hunterian Society were received by their President, Dr. Herbert Davies, on Monday evening last, at 23, Finsbury Square. In the course of the evening some original experiments were performed by Prof. Norris, of Birmingham, showing some hitherto unnoticed manifestations of the attraction of cohesion, with a view to explain the possibility of the passage of blood corpuscles through the capillaries in certain morbid states of the body, without the capillaries themselves being destroyed.

On the evening of November 5 two new planets were discovered at the Paris Observatory. The first, discovered by M. Paul Henry, about 9 o'clock, is of the 11th magnitude; the second, discovered by M. Prosper Henry, is in magnitude 11·5.

Prof. Winlock communicates to 1,909 of *Astronomische Nachrichten* carefully tabulated "Results in Right Ascension of Observations of 156 Fundamental Stars observed with the Meridian-Circle of Harvard College University" (in English).

It may not be generally known, says the *Astronomical Register*, that amongst other works translated of late years into the Chinese language are the following:—Herschel's "Outlines of Astronomy," by Wylie, 3 vols., sm. folio, China, 1859; De Morgan's "Algebra," by the same, 8vo., 1859; Mac Gowan's "Law of Storms," China, 1853; Milner's "History of England," abridged, by Muirhead, Shanghai, 1856. There is also a Treatise on Arithmetic, in Chinese, by Wylie, 1853.

The committee of the Palestine Exploration Fund have just received a first instalment of the work of surveying the Holy Land. It consists of the first three sheets of an Ordnance map of the country, on the scale of one inch to a mile, based on an accurate trigonometrical survey, and including the district between Jaffa and Jerusalem, and the country north of Jerusalem towards Nablous, and embracing an area of 560 square miles. The survey has been already completed over an area of about 1,000 square miles, and further sheets may be expected about the beginning of the new year.

The Ninth Report, just issued, of the Belfast Naturalists Field Club, speaks of continued activity and enterprise on the part of the Society. A considerable portion of the report is occupied by accounts of the various excursions, and short abstracts are also given of a number of papers read at its meetings, many of them having a chiefly local interest.

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